ROUTING SLIP

	MAIL CODE	NAME	ACTION
1.	USS-10	Millie Ruda	APPROVAL
2.			CALL ME
3.			CONCURRENCE
4.			FILE
5.			INFORMATION
6.			INVESTIGATE AND ADVISE
7.			NOTE AND FORWARD
			NOTE AND RETURN
			PER REQUEST
			PER TELEPHONE CONVERSATION
			RECOMMENDATION
			SEE ME
			SIGNATURE

Millie -

Please send to the facility with the following notation:

DO NOT ANNOUNCE AND DO NOT RELEASE BEYOND NASA.

Thanks.

Judy

MAIL CODE	NAME	TEL. NO.	DATE
MA-	Mr. T. A. Keegan	2-0443	11/4/67

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CR # 90612

BELLCOMM, INC.

SUBJECT: S-IVB Quarterly Report
Case 320

DATE: October 27, 1967

FROM: W. O. Campbell

ABSTRACT

The S-IVB Quarterly Progress Report of September 12, 1967, covered the following points:

All joints now have a factor of safety of 1.1 or greater for S-IC engine-out loads; the only hardware change was an increase in bolt diameter.

A 1/10 scale test of the effect of the O_2/H_2 burner exhaust impingement on the J-2 engine has been conducted; results indicate that there are no design problems.

A restartable O_2/H_2 burner has been developed.

The orbital safing kit will be installed on SA-205 to make it safe for rendezvous maneuvers in the immediate vicinity.

A test program has been defined to determine the 90 day re-cycle capabilities of the Auxiliary Propulsion System.

Tests are proposed to mount the LH_2 depletion sensor in various locations and configurations to determine the effect of fast fill on their erratic behavior.

The Orbital Work Shop mock-up is being modified; the major change is the dual floor configuration involving re-arrangement of crew quarters.

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MEMORANDUM FOR FILE

The S-IVB Quarterly review meeting, scheduled for September 12, was cancelled. However, the quarterly report prepared by Douglas Aircraft Company was sent to all authorized attendees. The following notes represent a summary of the report.

ENGINE-OUT LOADS

Panel tests have been conducted to determine the capability of the S-IVB joints to withstand the S-IC engine-out loads. Prior to the tests, the bolt at the interface between the S-IVB interstage and the S-II forward skirt was increased from 5/16 to 3/8 inch diameter. Results show that all the joints now have a factor of safety of 1.1 or greater during the malfunction condition of S-IC engine-out loads.

EXHAUST IMPINGEMENT TEST

A 1/10 scale test has been conducted to examine the effect of impingement of the O_2/H_2 burner exhaust plume on the J-2 engine nozzle. The test set-up included an electron beam gun which caused a GN_2 jet to fluoresce. Test data accuracy was within the expected limits, and the data followed the analytical predictions. No design problems for the vehicle are predicted.

RESTARTABLE O_2/H_2 BURNER

A total of 105 tests has been completed on the advanced restartable O_2/H_2 burner (used for helium heating). These tests have resulted in the development of a non-deteriorating ignition system. The burner can be restarted immediately after it has been shut down. It will be retrofitted to the SA-503 vehicle after static firing tests of the SA-506 vehicle.

ORBITAL SAFING

The SA-205 orbital safing kit makes the stage safe for rendezvous maneuvers in the immediate vicinity. The kit contains provisions for non-propulsive venting of LH_2 and LOX. It also provides for dumping of various pressurant bottles. Installation is scheduled to begin in December.

AUXILIARY PROPULSION SYSTEM

A test program is being defined to determine the 90 day recycle capabilities of the Auxiliary Propulsion System. The objectives include 1) a 90 day propellant exposure with burp firings at various intervals from 4 through 90 days, 2) dynamic vibration loads with live propellants, and 3) firing of engines equivalent to a nominal lunar mission duty cycle. The resulting data will be analyzed for conformance to design requirements and operational capabilities. The system will be disassembled to detect corrosion problems.

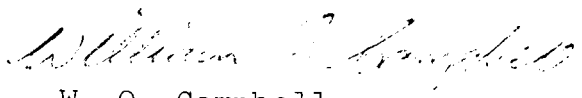
LH_2 DEPLETION SENSORS

The continuing concern about the erratic behavior of the LH_2 depletion sensors has led to a proposed series of tests. The purpose is to verify that sensor dropouts are the result of physical location and LH_2 flow pattern during the fast fill operation. The sensors will be mounted in various configurations to show the effect of location and shielding. A logic table has been prepared to show the relationship of the various results.

ORBITAL WORKSHOP

Stages 211 and 212 will be stored at Huntington Beach. This will facilitate making some Orbital Work Shop (OWS) modifications.

The OWS mock-up was received at Huntington Beach from MSFC for updating. The major change is a new dual floor configuration which involves a re-arrangement of crew quarters.



2031-WOC-mch W. O. Campbell